

Amendment in resp. to O.A. dtd. 6-29-99
Ser. No. 09/017,391 filed 2/2/98
LANGUAGE-DEPENDENT LETTER INPUT
BY MEANS OF NUMBER KEYS

protect. The application also has been amended to eliminate certain inconsistencies.

The invention, as disclosed and claimed, relates to a mobile phone with a limited keypad in which several characters can be associated with each key. Characters associated with a key are determined on the basis of the language selected as the operating language of the apparatus. The apparatus comprises a memory element which includes a certain part for storing information indicating which set of the possible characters entered as push-button commands is in use as well as character set tables for selectively associating certain characters with each key on the basis of the information in that part.

Claims 1-10 have been rejected under 35 U.S.C. 112, second paragraph, "... as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." In support of his rejection, the Examiner further said:

"The claims in general are unclear. The terms used are generally unclear and the antecedent basis is not clearly set forth. The following examples should not be viewed as an exhaustive list.

Regarding claim 1, it is not clear what is meant by stages. It is not clear how the production of information is related to the method.

Regarding claim 2, it is not clear what further step is added to the method. The step of pressing the keys to generate an input is not clearly set forth.

Regarding claims 3 and 4, these claim do not make sense and the specification does not clearly define the formulas.

Regarding claim 5, it is not clear how the limitation is related to claim I .

Regarding claim 6-9, it is not clear how these limitations are

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related to claim 1.

Regarding claim 10, the body of the claim appears to recite desired functions and does not recite elements or integrates these elements to achieve the desired functions."

Applicant appreciates the concerns expressed by the Examiner and will attempt to shed some more light on the invention and its unique features.

The expressions "mod" and "div" are computer programming terms which are widely used as the names of certain arithmetic operators. An expression " $n \text{ div } m$ " is equal to the integer part of the quotient n/m , and " $n \text{ mod } m$ " is equal to the integer remainder of such a quotient. For example " $11 \text{ div } 3$ " is 3, since $11/3$ is equal to $3.6666\dots$, and " $11 \text{ mod } 3$ " is 2, since $11 = 3 \times 3 + 2$.

These expressions are extremely useful for the concise description of cyclic operations, i.e. operations in which a certain return to start occurs at regular intervals if a plurality of identical inputs are given in succession. The application discusses the number of times a user presses a key. According to the first embodiment described on lines 25-28 on page 5 a "return to start" occurs each time when the number of successive keypresses exceeds the number of characters associated with the corresponding key, and a character is output only after the user stops giving new presses. As an example we may discuss a key with the characters "2abc" printed onto it and the characters "abc2ää" associated with it in the device's memory. If the user presses once, the result is "a". If the user presses twice, the result is "b". Continuing this way, if the user presses six times, the result is "å",

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and because a return to start occurs after six, if the user presses seven times, the result is again "a". The following table gives the results for the first 14 presses:

Press #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Result	a	b	c	2	ä	å	åa	åb	åc	å2	åä	åå	ååa	ååb

The letter "a" is the first one in the list of associated characters, i.e. the ordinal of letter "a" is one. The ordinal of letter "b" is two and so on until the ordinal of letter "å" is six. Generally, it may be said that there are m characters associated with the key (in the present example here, m=6). The most concise mathematical expression that yields the ordinal number of the resulting character after n presses is exactly $[(n-1) \bmod m] + 1$. For example, with 9 presses (n=9): 9-1 leaves 8; 8 is divided by 6 and to the remainder, which is 2, one is added, yielding 3. The character the ordinal of which is 3 is "c", and as one can see from the above-given table the result after 9 presses is "c".

The second embodiment, the description of which starts on line 28 on page 5 of the specification, differs from the above-described one in that there is no "return to zero" without a resulting character: m+1 successive presses are interpreted as m presses followed by 1 press so that the m presses mean the m:th character in the list. If one presses the exemplary "2abc" key with the six associated characters "abc2ää" five times, "a" results. If one presses six times, an "å" results. If one presses seven times, the first six of these are taken to represent "å" and the next one means "a" exactly as if the key had been pressed only once, so the result is "åa".

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In the following table, consider the results for the first 14 presses:

Press #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Result	a	b	c	2	ä	å	åa	åb	åc	å2	åä	åå	åå	ååb

The description says that after n presses the result consists of $(n-1) \div m$ times the last character in the list of associated characters as well as the character the ordinal of which is $[(n-1) \bmod m] + 1$. Doing this with $n=14$: $14-1$ results in 13; the integer part of the quotient $13/6$ is 2, resulting, first, in 2 times å, which is the last character. After that, the latter expression is taken: again $14-1$ which again yields 13; the integer remainder of $13/6$ is 1; and $1+1$ yields 2; after said 2 times å, the result is additionally "b" because the ordinal of "b" is 2. A check with the table above verifies that the result for 14 presses is indeed "ååb".

Independent claim 1, from which claims 2-9 depend, and independent claim 10 have been amended to more accurately recite the invention sought to be protected by the inventor. With these changes, taken together with the detailed explanation provided above, it is submitted that claims 1-10 now conform with the requirements of 35 U.S.C. 112, second paragraph, and a finding to this effect is respectfully solicited.

Claims 1, 5-6, and 9 have been rejected under 35 U.S.C. 102(b) as being anticipated by Mitsuru with the Examiner's added commentary:

"Due to the indefinite nature of the claims a best effort attempt has

been made to apply the most appropriate art.

Regarding claim I, the abstract teaches the step of producing information for a set of characters and the keys are associated with the selected set of characters.

Regarding claim 5, the selection of a set of characters corresponds to the language of the keyboard at the time.

Regarding claim 6, cols. 2-3 states that the selection of a language is done after a key is pressed but that it is also possible for the selection before the pressing of a key. A display means is available to show the characters.

Regarding claim 9, the use of a cursor to select a function and the pressing of a key to select the function once the cursor is properly positioned is shown in Fig. 22. The selection means is shown as items 42-45 of fig. 6."

Claim 1, as amended, now recites, in pertinent part:

"A method for producing character input in a portable terminal of a cellular radio system, the portable terminal having a numeric keypad...associating each key in the numeric keypad with a certain subset of characters belonging to the selected set of characters...selecting a key associated with the desired subset of characters; and...pressing the key successively until the desired character is produced."

The reference publication cited by the inventor's first name, Mitsuru, is known to the applicant as Takehara (EP 588 538). It discloses a computer device where the keyboard is remarkably larger and has many more keys than the small 12 key keypad of conventional mobile telephones. If one compares Fig. 6 of Takehara against the left-hand side of Fig. 1 in the present patent application, it is immediately noted that Takehara requires the basic alphanumeric keyboard

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(designators 19, 20, 22, 24, 25, 26, 27) 28 and 29) to comprise 55 keys. Additionally the Takehara device has separate "yes" and "no" keys 51 and 52, arrow keys 42, 43, 44 and 45 the ON/OFF-switch 33, which altogether makes 62 keys. The present invention deals with telephone devices and small keyboards where the basic part only consists of 12 keys. It is admittedly true that Takehara's Figs. 22-28 and the associated description starting from line 43 in ciara's 14 discuss the possibility of associating different letters to certain letter keys according to the language which has been chosen as the operational language. However, there are two basic differences to the solution of the invention. First, the letters are associated exclusively with letter keys (designator 23). Takehara does not discuss at all the numerical keypad 29, which in the Takehara device would most closely correspond to the keypad in the present invention. Another even more important difference is that Takehara requires the provision of a specific conversion key 25. If the user wants to input a special character he has to first press a letter key and immediately thereafter, the conversion key, which is in another part of the keypad and requires the user to either use his other hand or to move the punching hand over the whole keyboard.

In his application, the present applicant has pointed out that there is a constant pressure to make the cellular telephones smaller and smaller. Consequently, if one would apply the teachings of Takehara to known telephones, one should *both* provide more letter keys for inputting letters, and additionally provide a completely separate conversion key. Both these requirements are in clear conflict with the general trends in developing novel cellular telephones, and would lead the person

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skilled in the art away from the direction of the present invention. Even if, for the sake of example only, we would allow the person skilled in the art to neglect the teaching for providing more keys, and only apply Takehara to the limited selection of keys present in conventional mobile telephones, there would remain the need for providing a separate conversion key.

It is considered appropriate to make note of the clear and unmistakable policy of the Court of Appeals for the Federal Circuit regarding anticipation. In the noteworthy case of Structural Rubber Products Co. v. Park Rubber Co. et al., 223 USPQ 1264 (CAFC 1984), that Court stated

"This court has repeatedly stated that the defense of lack of novelty (i.e., 'anticipation') can only be established by a single prior art reference which discloses each and every element of the claimed invention. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984); Radio Steel & Mfg. Co. v. MTD Products, Inc., 731 F.2d 840, 845, 221 USPQ 657, 661 (Fed. Cir. 1984); Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); Kalman v. Kimberly - Clark Corp., 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983); SSIH Equipment, S.A. v. U.S. Int'l. Trade Comm'n., 718 F.2d 365, 377, 218 USPQ 678, 688 (Fed. Cir. 1983)."

As to each of independent claims 1 and 10, there is simply no prior disclosure of each and every element of the claimed invention for the cogent reasons related above and it

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is submitted that these claims are therefore patentable over Takehara (EP 588 538). Further, since each of the claims 5, 6, and 9 are depended from claim 1 and therefore include all of the limitations of claim 1 and further define the invention, each of those claims should also be deemed patentable over Takehara. A finding to this effect is respectfully solicited.

Claims 2-4, 7-8, and 10 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuru in view of Jones. The Examiner further commented:

“Due to the indefinite nature of the claims a best effort attempt has been made to apply the most appropriate art.

Regarding claims 2-4, Mitsuru does not teach the input of a character in response to successive key presses. Jones teaches in col. I that the pressing of a key multiple times to select a function is well known. It would have been obvious to one of ordinary skill in the art that a key that is associated with multiple functions may have its functions selected by the method taught in Jones. Jones is considered to be analogous art because it is in the same keyboard field and solves the same problem.

Regarding claims 7-8, the ordering of the particular functions associated with a key is an obvious design choice. It is well known that function are ordered alphabetically so that their relative positions is easily determined and the ordering of functions that are used most frequently first also facilitates the use of the functions.

Regarding claim 10, this claim essentially recites the apparatus for performing the selection function. Since the method has been shown to be obvious, the device for performing the method would also have been obvious. 8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.”

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The patent to Jones discloses a scientific calculator with a relatively large keyboard and related method for accessing and selecting among multiple key functions with a minimum of keystrokes. The keyboard includes menu keys corresponding to menu labels displayable on the display and a multi-function key having a primary function and a secondary function. Which of the key functions is selected depends upon the duration of the key press and not on the number of consecutive times the key is pressed as provided by the instant invention. The applicant emphasizes that the Jones patent relates to the field of scientific calculators which can accommodate a relatively large keyboard and not to portable telephones which have an exceptionally limited space for a keyboard. Because of this, individual keys of a portable telephone must accommodate multiple characters and it is also necessary that these characters be displayed one by one by means of discrete key strokes, not in a fluid fashion requiring the user to employ exceptional skill in carefully stopping processing at the desired character, all while performing other operations relating to the phone or even other activities.

In this instance, it seems appropriate to note the meaningful holding of the court in the important case of ACS Hospital Systems, Inc. v. Mortifiore Hospital et al. 221 U.S.P.Q. 929, 933 (CAFC 1984), namely, that: "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." The same court held similarly on another occasion: "The lesson of this case [In re Imperator, 179 U.S.P.Q. 730 (CCPA 1973)] appears to be that prior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived

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from combining their teachings." In re Sernaker, 217 U.S.P.Q. 1, (CAFC 1983). In short, to "imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." W. L. Gore & Associates, Inc. v. Garlock, Inc., 220 U.S.P.Q. 303,312 (CAFC 1983

Neither patent discloses the use of number keys operated successively to obtain a desired character. In fact, it is unclear just how such a combination would be achieved and for what purpose it would be achieved absent the applicant's teaching itself.

In short, applying the foregoing authority to the instant fact situation, it is submitted that claims 2-4, 7-8, and 10 are patentable over Jones in view of Takehara and a finding to this effect is respectfully solicited.

Applicant acknowledges Examiner's statement that: "The prior art made of record and not relied upon is considered pertinent to applicant's disclosure". However, it is submitted that none of these references, either taken individually or in combination with any of the prior art of record, will render unpatentable any of claims 1-10 in the application, as presently written, and applicant concurs with the Examiner's determination in this regard.

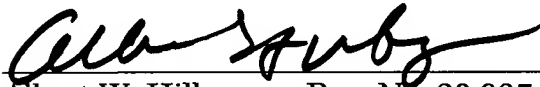
In light of the significant amendments to claims 1 and 10, the discussion of the prior art as it has been applied in the rejection of the claims, and in light of the arguments

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presented, it is respectfully requested that the Examiner see fit to allow all of the claims presently under rejection, namely, claims 1-10, thereby enabling a patent to issue by an early date.

Respectfully submitted,



Albert W. Hilburger, Reg. No. 20,987
Perman & Green
425 Post Road
Fairfield, CT 06430
203-259-1800

9/20/99

Date

CERTIFICATE OF MAILING

I hereby certify that this amendment in response to the PTO Office Action dated June 29, 1999 is being deposited with the United States Postal Service today as first class mail addressed to Assistant Commissioner for Patents, Box NON-FEE AMENDMENT, Washington, D.C. 20231.

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